

**Practice: 521A - Pond Sealing or Lining, Flexible Membrane****Scenario: #1 - Flexible Membrane - Uncovered without liner drainage or venting****Scenario Description:**

Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Scenario Feature Measure:** Surface area of Liner Material (including anchorage)

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420

**Scenario Cost:** \$24,118.16

**Scenario Cost/Unit:** \$9.97

**Cost Details (by category):**

| Component Name                | ID   | Component Description   | Unit        | Price (\$/unit) | Quantity | Cost        |
|-------------------------------|------|---|-------------|-----------------|----------|-------------|
| <b>Equipment/Installation</b> |      |   |             |                 |          |             |
| Geotextile, woven             | 42   | Woven Geotextile Fabric. Includes materials, equipment and labor  | Square Yard | \$2.28          | 2420     | \$5,517.60  |
| <b>Labor</b>                  |      |   |             |                 |          |             |
| Specialist Labor              | 235  | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour        | \$97.78         | 32       | \$3,128.96  |
| Skilled Labor                 | 230  | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.   | Hour        | \$29.84         | 40       | \$1,193.60  |
| <b>Materials</b>              |      |   |             |                 |          |             |
| Synthetic Liner, 40 mil       | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.  | Square Yard | \$5.90          | 2420     | \$14,278.00 |

**Practice: 521A - Pond Sealing or Lining, Flexible Membrane****Scenario: #2 - Flexible Membrane - Uncovered with liner drainage or venting****Scenario Description:**

Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Scenario Feature Measure:** Surface area of Liner Material (including anchorage)

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420

**Scenario Cost:** \$31,353.96

**Scenario Cost/Unit:** \$12.96

**Cost Details (by category):**

| Component Name                | ID   | Component Description   | Unit        | Price (\$/unit) | Quantity | Cost        |
|-------------------------------|------|---|-------------|-----------------|----------|-------------|
| <b>Equipment/Installation</b> |      |   |             |                 |          |             |
| Geotextile, woven             | 42   | Woven Geotextile Fabric. Includes materials, equipment and labor  | Square Yard | \$2.28          | 2420     | \$5,517.60  |
| <b>Labor</b>                  |      |   |             |                 |          |             |
| Specialist Labor              | 235  | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour        | \$97.78         | 32       | \$3,128.96  |
| Skilled Labor                 | 230  | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.   | Hour        | \$29.84         | 40       | \$1,193.60  |
| <b>Materials</b>              |      |   |             |                 |          |             |
| Synthetic Liner, 40 mil       | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.  | Square Yard | \$5.90          | 2420     | \$14,278.00 |
| Geonet                        | 1778 | Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.   | Square Yard | \$2.99          | 2420     | \$7,235.80  |

**Practice: 521A - Pond Sealing or Lining, Flexible Membrane****Scenario: #3 - Flexible Membrane - Covered without liner drainage or venting****Scenario Description:**

Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, and a geotextile or soil cushion to protect liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Scenario Feature Measure:** Surface area of Liner Material (including anchorage)

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420

**Scenario Cost:** \$27,338.09

**Scenario Cost/Unit:** \$11.30

**Cost Details (by category):**

| Component Name                | ID   | Component Description   | Unit        | Price (\$/unit) | Quantity | Cost        |
|-------------------------------|------|---|-------------|-----------------|----------|-------------|
| <b>Equipment/Installation</b> |      |   |             |                 |          |             |
| Earthfill, Roller Compacted   | 49   | Earthfill, roller or machine compacted, includes equipment and labor  | Cubic yard  | \$3.99          | 807      | \$3,219.93  |
| Geotextile, woven             | 42   | Woven Geotextile Fabric. Includes materials, equipment and labor  | Square Yard | \$2.28          | 2420     | \$5,517.60  |
| <b>Labor</b>                  |      |   |             |                 |          |             |
| Skilled Labor                 | 230  | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.   | Hour        | \$29.84         | 40       | \$1,193.60  |
| Specialist Labor              | 235  | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour        | \$97.78         | 32       | \$3,128.96  |
| <b>Materials</b>              |      |   |             |                 |          |             |
| Synthetic Liner, 40 mil       | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.  | Square Yard | \$5.90          | 2420     | \$14,278.00 |

**Practice: 521A - Pond Sealing or Lining, Flexible Membrane****Scenario: #4 - Flexible Membrane - Covered with liner drainage or venting****Scenario Description:**

Installation of a flexible geosynthetic membrane liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection, a geotextile or soil cushion to protect liner from subgrade damage, and liner drainage or venting. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Scenario Feature Measure:** Surface area of Liner Material (including anchorage)

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 2,420

**Scenario Cost:** \$34,573.89

**Scenario Cost/Unit:** \$14.29

**Cost Details (by category):**

| Component Name                | ID   | Component Description   | Unit        | Price (\$/unit) | Quantity | Cost        |
|-------------------------------|------|---|-------------|-----------------|----------|-------------|
| <b>Equipment/Installation</b> |      |   |             |                 |          |             |
| Earthfill, Roller Compacted   | 49   | Earthfill, roller or machine compacted, includes equipment and labor  | Cubic yard  | \$3.99          | 807      | \$3,219.93  |
| Geotextile, woven             | 42   | Woven Geotextile Fabric. Includes materials, equipment and labor  | Square Yard | \$2.28          | 2420     | \$5,517.60  |
| <b>Labor</b>                  |      |   |             |                 |          |             |
| Specialist Labor              | 235  | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour        | \$97.78         | 32       | \$3,128.96  |
| Skilled Labor                 | 230  | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.   | Hour        | \$29.84         | 40       | \$1,193.60  |
| <b>Materials</b>              |      |   |             |                 |          |             |
| Synthetic Liner, 40 mil       | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.  | Square Yard | \$5.90          | 2420     | \$14,278.00 |
| Geonet                        | 1778 | Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.   | Square Yard | \$2.99          | 2420     | \$7,235.80  |